

SECTION 401 - TEMPORARY EROSION AND POLLUTION CONTROL

1. DESCRIPTION

This work shall consist of the installation, maintenance and removal of temporary erosion and pollution control devices as required during the construction of the project. All materials, equipment and construction shall conform to the latest version of section 901 of the Kansas Department of Transportation (KDOT) Standard Specifications and as herein.

<u>BID ITEMS</u>	<u>UNITS</u>
Temporary Berm	Linear Foot
Temporary Slope Drain	Linear Foot
Temporary Slope Barrier (Set Price)	Linear Foot
Temporary Ditch Check	Linear Foot
Temporary Ditch Check (Rock) (Set Price)	Cubic Yard
Temporary Inlet Sediment Barrier	Each
Temporary Sediment Basin	Cubic Yard
Temporary Stream Crossing	Each
Sediment Removal (Set Price)	Cubic Yard
Temporary Fertilizer (**)	Pound
Temporary Seed (***)	Pound
Soil Erosion Mix	Pound
Temporary Seeding	Lump Sum
Erosion Control (*)	Square Yard
Mulching (Temporary)	Acre
Mobilization (Emergency Erosion Control) (Set Price)	Each
Temporary Construction Entrance	Ton
* Class & Type	
** Type of Fertilizer	
*** Type	

2. MATERIALS

a. Provide sediment barriers, fertilizers, seeds, soil erosion mix, erosion control materials and mulch that comply with DIVISION 2100.

Provide aggregate that complies with aggregate ditch lining, $D_{50} = 6$ inches, DIVISION 1100. Existing aggregate from the project may be used under this specification, provided all applicable physical requirements are met.

b. Temporary Slope Drain. Provide metal pipe, plastic pipe or flexible rubber pipe for temporary slope drains.

The Engineer will accept the material for temporary slope drain based on the condition of the pipe and visual inspection of the installed drain.

c. Biodegradable Logs. Provide commercially available biodegradable logs manufactured from rice straw, excelsior wood fiber, coconut fiber, jute or other biodegradable material bound with an open mesh fabric of jute or light-weight plastic.

The Engineer will accept the biodegradable logs based on compliance with dimensional and other requirements shown in the Contract Documents, and visual inspection of the installed material.

d. Geo-Ridge Permeable BermTM or equivalent. The Environmental Scientist (Bureau of Design, Environmental Services Section) will consider an equivalent of the brand name specified. Provide the Engineer with a complete description, literature, test reports, etc. on the proposed equivalent.

The Engineer will accept the Geo-Ridge Permeable BermTM (or an equivalent approved by the Environmental Scientist) based on brand name and visual inspection of the installed material.

e. Triangular Silt DikeTM or equivalent. The Environmental Scientist (Bureau of Design, Environmental Services Section) will consider an equivalent of the brand name specified. Provide the Engineer with a complete description, literature, test reports, etc. on the proposed equivalent.

The Engineer will accept the Triangular Silt DikeTM (or an equivalent approved by the Environmental Scientist) based on brand name and visual inspection of the installed material.

f. Gravel Bags. Small gravel-filled durable bags that are placed, stacked, or piled to form temporary diversions, barriers or ditch checks.

Bags shall be woven polypropylene, polyethylene, or polyamide fabric or burlap having a minimum unit weight of 4 ounces per square yard. The Mullen burst strength shall exceed 300 pounds per square inch per ASTM D3786 and shall have ultraviolet stability exceeding 70% per ASTM D4355. Bags shall be filled with clean, coarse aggregate from ½" to 1" diameter and securely sealed. Bags may be of any size suitable for hand placement and carrying. A typical bag size is 18-inches long, 12-inches wide and 3-inches thick with a weight of 30-35 pounds when loosely filled.

g. Temporary Construction Entrance. A stabilized layer of large aggregate placed atop a non-woven geotextile located in areas of high traffic and at the construction entrance, intended to prevent mud and silt from becoming embedded in tires or tracked off-site and to protect the site from rutting. Stone shall be of size and thickness as shown on the drawings.

3. CONSTRUCTION REQUIREMENTS

a. Responsibility. Take all measures necessary to prevent erosion and pollution on the project and project related borrow areas.

Use City of Salina Construction Site Stormwater Best Management Practices (BMP) Manual as a guide for the design, installation and maintenance of temporary erosion control measures.

Install erosion control devices according to the approved erosion control schedule prior to or simultaneously with the clearing and grubbing operations. Do not perform grading until erosion control devices are in place as approved by the Engineer. Install devices to establish a perimeter control of the project in areas where it is anticipated that stormwater runoff will leave the project.

Update the erosion control schedule as work progresses to show changes due to revisions in work schedules or sequence of construction, or as directed by the Engineer. Update the site map to reflect erosion control devices that have been installed.

As a minimum, perform the following erosion control actions:

- Use temporary erosion and pollution control actions to control erosion resulting from the construction of the project;
- Use temporary erosion and pollution control measures to prevent contamination of adjacent streams or other watercourses, lakes, ponds or other areas of water impoundment;
- Coordinate temporary erosion and pollution control measures with the construction of permanent erosion control features to provide continuous erosion control;
- Schedule construction of drainage structures and permanent erosion control features as soon as practical; and
- Initiate temporary erosion and pollution control measures for areas that have been disturbed, within 14 calendar days after construction activities have temporarily or permanently ceased on a portion of the project site. Exceptions are as follows:
 - If implementation of erosion and pollution control measures is precluded by snow cover, undertake such measures as soon as practical.
 - If construction activities will resume on the portion of the project site within 21 calendar days, temporary erosion and pollution control measures do not have to be initiated.

Update the erosion control schedule as work progresses to account for changes due to revisions in work schedules or sequence of construction, or as directed by the Engineer. Update the site map to reflect erosion control devices that have been installed.

b. Permits. The City will obtain a National Pollutant Discharge Elimination System (NPDES) permit for projects with 1 acre or more of erodible surface. When Contractor-furnished borrow is required, obtain all required permits and clearances required for compliance.

A NPDES permit is not required for a project with less than 1 acre of erodible surface. The Contractor is not required to submit an erosion control schedule. The Contractor is required to comply with the concepts for erosion and pollution control presented in the City of Salina Construction Site Stormwater Best Management Practices (BMP) manual , see subsection 3d.

c. General. Unless approved in writing by the Engineer, do not exceed 750,000 square feet of surface area of erodible earth material per equipment spread at one time. The Engineer will limit the surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and embankment operations. Limit the exposed erodible earth material according to the capability and progress and in keeping with the approved schedule.

If on-site or state-furnished off-site borrow areas are to be excavated below the ground water elevation, construct a permanent berm around the borrow area to prevent stormwater runoff from entering the excavated area.

Restrict construction operations in rivers, streams and other water impoundments to those areas that must be entered for the construction of temporary or permanent structures. When no longer required, promptly remove all false work, piling, temporary crossings and other obstructions caused by the construction.

Do not ford live streams with construction equipment.

As dictated by weather conditions, actual site conditions and construction procedures, install and maintain temporary erosion and pollution control devices as shown in the Contract Documents, and as directed by the Engineer.

Implement temporary erosion and pollution control with berms, slope drains, ditch checks, slope barriers, sediment basins, inlet sediment barriers, fertilizer, seeding, mulching and erosion control blankets.

If temporary erosion and pollution control is not implemented and maintained according to the approved schedule, all work on the project shall cease until conditions are brought into compliance, as determined by the Engineer.

d. Project Storm Water Pollution Prevention Plan (SWPPP). Include in the project SWPPP, KDHE Notice of Intent (NOI) For Authorization to Discharge Stormwater Runoff from Construction Activities, Contract Documents pertaining to temporary erosion and water pollution control, inspection and maintenance reports, and the Contractor's erosion control schedule. City of Salina SWPPP template can be found on the City website at www.salina-ks.gov.

Before any construction activities begin, the Contractor and subcontractors implementing any measures identified in the SWPPP are required to certify that they understand the terms and conditions of the general NPDES permit. The Engineer will provide the certification form.

Before the preconstruction conference, submit to the Engineer 3 copies of a schedule for implementing and maintaining erosion and pollution control work during the construction phases. No contract work may begin until the Engineer has approved the erosion control schedule. As a minimum, the following information shall be included in the Contractor's erosion control schedule:

(1) The planned sequence of major construction activities.

(2) A site map showing the locations and devices to be used for the initial perimeter controls.

(3) A description of controls to be used:

- Stabilization practices for all areas disturbed by construction;
- Structural practices for all drainage/discharge locations; and
- Other controls, including:
 - Waste disposal practices which prevent discharge of solid materials into water in the U.S.;
 - Methods of preventing contamination in areas designated for fuel and lubrication storage;
 - Actions to minimize off-site tracking of sediment by construction vehicles;
 - Actions to obtain compliance with state or local waste disposal, sanitary sewer or septic system regulations; and
 - When actions will be implemented, including permanent erosion control items when required in the Contract Documents.

(4) Acknowledgment that State and Local requirements have been included in the schedule.

(5) Provide a Maintenance and Inspection Report. See subsection 3q.

e. Temporary Berms. Use temporary berms to divert storm runoff to stabilized slopes or temporary slope drains. Construct temporary berms as shown in the Contract Documents. Compact the berms until no further consolidation is observed, using a dozer track, grader wheel or other equipment.

f. Temporary Slope Drains. Use temporary slope drains to carry storm runoff down fill slopes and cut back slopes. Construct the temporary slope drains as shown in the Contract Documents.

g. Temporary Slope Barriers. Use any of the materials listed in the Contract Documents to construct temporary slope barriers.

When temporary biodegradable logs, straw or hay bales are used, remove and dispose of the sediment when deposits reach approximately $\frac{1}{2}$ the height of the log or bale.

When conditions warrant, supplement the temporary silt fence with a support fence. Reduce the post spacing and drive the posts further in the ground in low and soft, swampy areas. Remove and dispose of sediment deposits when the deposit approaches $\frac{1}{3}$ the height of the silt fence.

h. Temporary Ditch Checks. The option exists to use any materials listed in the Contract Documents, excluding rock, to construct temporary ditch checks. When deposits reach approximately $\frac{1}{2}$ the height of the temporary ditch check, remove and dispose of the accumulated sediment.

i. Temporary Ditch Checks Rock. Use rock to construct temporary rock ditch checks listed in the Contract Documents. When deposits reach approximately $\frac{1}{2}$ the height of the temporary rock ditch check, remove and dispose of the accumulated sediment.

j. Temporary Inlet Sediment Barrier. Use any of the materials listed in the Contract Documents to construct temporary inlet sediment barriers.

When temporary silt fence is used, reduce post spacing and drive the posts further into the ground in low and soft, swampy areas. Remove and dispose of the sediment when deposits reach approximately $\frac{1}{3}$ the height of the silt fence.

When temporary triangular silt dike is used, remove and dispose of the sediment when deposits reach approximately $\frac{1}{2}$ the height of the silt dike.

When gravel bags are used the bags shall be placed tightly together with no gaps between individual bags or adjacent curbs, walls or other surfaces against which they are placed. Sediment that is stopped by and stored behind the bag shall be removed after every rainfall.

k. Temporary Sediment Basins. Before constructing a temporary sediment basin, clear the area of all vegetation. Construct the temporary sediment basin with a wide cross-section and a minimum grade, as shown in the Contract Documents. Dispose of excess excavated material.

Remove and dispose of the accumulated sediment when deposits reach approximately $\frac{1}{3}$ the depth of the structure.

l. Temporary Stream Crossing. Use any of the materials shown in the Contract Documents to construct temporary stream crossings.

When the Contractor's operations require a temporary stream crossing, and one is not shown in the Contract Documents, the Contractor may install one at no cost to the City. Comply with all applicable rules and regulations, obtain all required permits and provide copies of all permits to the Engineer.

m. Temporary Fertilizer, Seed and Mulch. Prepare the seedbed, fertilize, seed and mulch according to KDOT DIVISION 900. Apply the temporary fertilizer, seed and mulch at the rates shown in the Contract Documents.

n. Soil Erosion Mix. Prepare a smooth, weed-free and debris-free area, and broadcast or hydro-seed the soil erosion mix seed over the prepared area. Lightly hand rake broadcasted seed before placement of the erosion control.

o. Temporary Seeding. "Temporary Seeding" is to be used only if the project has less than 1 acre of erodible surface. If this item is used, fertilize, seed and mulch all exposed erodible earth.

Prepare the seedbed, fertilize, seed and mulch according to DIVISION 900. Apply the temporary fertilizer, seed and mulch at the rates shown in the Contract Documents.

p. Erosion Control. After seeding according to KDOT DIVISION 900, install erosion control according to the manufacturer's requirements for edge and junction overlaps, staple size and staple pattern.

(1) Areas with Erosion Control (Class I). Place the Erosion Control (Class I). Do not mulch over the Erosion Control (Class I).

(2) Areas with Erosion Control (Class II). Place the Erosion Control (Class II) and cover it with ½ inch of pulverized, fine-grained soil. Hand rake the soil into the erosion control material; then mulch the area according to KDOT SECTION 904.

q. Maintenance and Removal of Temporary Erosion and Pollution Control Devices. Maintain the effectiveness of the temporary erosion and pollution control devices as long as required to contain sediment runoff. Inspect the temporary erosion and pollution control devices and complete the inspection and maintenance reports every seven days and within 24 hours of a rainfall event of ½ inch or more. Monitor temporary erosion and pollution control devices at least daily during prolonged rainfall. Within 48 hours, begin corrective action of any deficiencies found in the perimeter controls, and complete corrective actions within 7 calendar days. Correct all other devices as soon as conditions allow access to their location without causing additional damage to the slopes.

Submit copies of inspection and maintenance reports to the Engineer within 3 working days after an inspection has been made. Use either City of Salina -furnished maintenance report forms or approved Contractor's or KDOT's maintenance forms.

Remove the temporary devices when directed by the Engineer. After removing the temporary erosion and pollution control devices, remove and dispose of the silt accumulation. Grade, fertilize, seed and mulch any bare areas.

When temporary erosion and pollution control devices are installed according to the Contract Documents, or as approved by the Engineer and such devices are no longer effective because of deterioration or functional incapacity, payment will be made for replacement of these devices, as directed by the Engineer. No payment will be made for replacing temporary erosion control devices that become ineffective because of improper installation, lack of maintenance or the Contractor's failure to pursue timely installation of permanent erosion control devices according to the Contract Documents.

Remove temporary erosion control devices following sufficient establishment of vegetation to control erosion. Contractor shall be responsible for final device removal regardless of the contract completion date or other dates included in the contract documents.

r. Mobilization for Emergency Erosion Control and Erosion Control Mobilization Delay Damages.

(1) Mobilize sufficient personnel, equipment, materials and incidentals to the job site within 24 hours after receiving the Engineer's written order to conduct temporary erosion control work on an emergency basis (24-hour period), unless extended by the conditions of subsection 3r.(5). Note: "sufficient personnel, equipment, materials and incidentals" is considered to be enough to complete all emergency erosion control within the seven days from date of notice.

(2) An emergency is a sudden occurrence of a serious nature that causes perimeter erosion control devices to fail (in whole or in part) allowing sediment to be deposited onto adjacent property or streams, or creating a risk that sediment will be deposited onto adjacent property or streams. The work is beyond normal maintenance of erosion control items and requires immediate movement of necessary personnel, equipment, materials and incidentals to the project site. The emergency may require immediate corrective work, installation of erosion control measures or both.

(3) If the Contractor mobilizes to the project within the 24-hour period or an approved extension under subsection 3r.(5), the Engineer will pay Mobilization (Emergency Erosion Control) (Set Price).

(4) If the Contractor fails to mobilize to the project within the 24-hour period or approved extension under subsection 3r.(5), the Contractor is liable for Erosion Control Mobilization Delay Damages. The Erosion Control Mobilization Delay Damages charged and owing are \$500.00 per calendar day for each calendar day (including Sundays, Holidays and the Winter Holiday Period) that the Contractor fails to mobilize to the project after the 24-hour period or approved extension expires. See subsection 3r.(1).

(5) The Engineer may extend the mobilization time beyond the 24-hour period for unusually severe weather or Acts of God that prevent the Contractor from mobilizing to the project site.

s. Erosion Control Disincentive Assessment. If the Contractor fails to complete corrective actions of the perimeter controls within the 7 calendar days required under subsection 3q., the Contractor is liable for an Erosion Control Disincentive Assessment. The Erosion Control Disincentive Assessment charged and owing is \$250.00 for each erosion control device deficiency and for each calendar day (including Sundays, Holidays and the Winter Holiday Period) the deficiency remains uncorrected.

t. Computing Mobilization Delay Damages and Erosion Control Disincentive Assessment. The Engineer will deduct and withhold the Erosion Control Mobilization Delay Damages under subsection 3r.(4) and Erosion Control Disincentive Assessment under subsection 3s. to either or both concurrently, as applicable. The assessments are to be computed in the same manner as damages under subsection 108.8, (Liquidated Damages) except calendar days include Sundays, Holidays and the Winter Holiday Period.

u. Indemnify City or any other NPDES permit holders from fines that KDHE or EPA impose because of the Contractor's failure to comply with applicable laws, regulations, ordinances and permits.

v. Temporary construction entrances shall be constructed where shown on the plans or directed by the Engineer. Contractor shall avoid locating entrances on steep slopes or at curves on public roads. Where possible, entrances and pads shall be located where permanent roads will eventually be constructed. All existing vegetation and other unsuitable material shall be removed from the foundation area. The area shall be graded and crowned for positive drainage. The existing subgrade shall be compacted by three passes of heavy vehicles before the geotextile fabric is placed. The stone is laid down and compacted by another three passes of heavy vehicles. Divert all surface runoff and drainage from the stone pad. Reshape pad as needed for drainage and runoff control. Top dress with clean stone as needed.

4. MEASUREMENT AND PAYMENT

The Engineer will measure temporary berms, temporary slope drains, temporary slope barriers and temporary ditch checks by the linear foot.

The Engineer will measure temporary rock ditch checks by the cubic yard.

The Engineer will measure each temporary inlet sediment barrier and temporary stream crossing as a unit.

The Engineer will measure temporary sediment basins by the cubic yard excavated to construct the basin.

The Engineer will measure sediment removal by the cubic yard of sediment removed.

The Engineer will measure temporary fertilizer, temporary seed and soil erosion mix by the pound.

The Engineer will measure "Temporary Seeding" as a lump sum; no measurement of area is made.

The Engineer will measure erosion control by the square yard.

The Engineer will measure temporary mulching by the acre.

The Engineer will measure Mobilization, Emergency Erosion Control per each mobilization ordered by the Engineer.

The Engineer will measure any disincentive assessment on an each device per day basis.

The Engineer will measure any erosion control mobilization delay damages by the lump sum.

Payment for the various items of temporary erosion and pollution control is full compensation for the specified work. Contract unit prices will govern regardless of overruns or under runs of the estimated quantity.

Payment for "Temporary Slope Barrier (Set Price)," "Temporary Ditch Check Rock (Set Price)," "Sediment Removal (Set Price)" and "Mobilization, Emergency Erosion Control (Set Price)" at the contract set unit prices is full compensation for the specified work.